

On some PARASITICAL INSECTS from CHINA.
By HENRY GIGLIOLI.

SOME time since, Mr. Swinhoe, who has done so much towards advancing our knowledge of Chinese ornithology, presented me with several parasitical insects, which he had met with during his zoological investigations in China. Finding them interesting and mostly new, I thought that a description of them might be useful.

They are seven in all; four belonging to the *Anoplura*, and the three others to the *Diptera*. I shall commence with the former; first giving my best thanks to Mr. H. Denny, of Leeds, who has most kindly assisted me in identifying the species.

It is to that persevering Italian naturalist, Francesco Redi, that the history of epizoid parasites owes its beginning, towards the latter part of the seventeenth century. Since then, De Geer, Fabricius, Latreille, Leach, and Burmeister, have contributed not a little to that part of entomology which the recent labours of Léon Dufour, Denny,* and Gervais,† have so much advanced.

De Geer first divided them into—*Pediculi* (with a suctorial mouth, and inhabiting chiefly mammals), and *Ricini* (with a mandibulated mouth, and living mostly on birds). Dr. Leach included both divisions under the term *Anoplura*.

Those I shall describe belong to the *Ricini*. These creatures abound on birds, many species of which possess their peculiar louse, and some even two or three species, found only on them; they hide amongst the feathers, on the extremities of which they appear when the bird dies.

Some authors opine that the down next to the skin constitutes their nourishment, while others, with more reason, think that they live on the blood of their host.

The Anoplura here described all belong to the old genus *Philopterus* of Nitzsch, which has by subsequent authors been divided into several genera.

Genus LIPEURUS, Nitzsch.

Body more or less narrow and elongated. Head of moderate size, rather narrow; cheeks rounded, no *trabeculæ*.

* H. Denny, 'Monogr. Anoplurorum Britanniaë.'

† Walckenaer et Gervais, 'Hist. Nat. des Insectes Aptères,' vol. iii, pp. 307—361, Paris, 1844.

‡ 'Thierinsekten,' p. 34.

Antennæ greatly modified and cheliform in the male, having the first joint much longer and thicker than the rest; in the female they are straight and simple. Last segment of the abdomen notched behind in the male, truncated and notched, or wholly cleft.

The species of this genus have been observed on diurnal *Raptores*, *Gallinæ*, *Grallæ*, *Natatores*, and *Cursores*; they are of large size.

Lipeurus Diomedæ, Dufour. (Pl. I B, figs. 1, 2.)

Pediculus Diomedæ, Fabricius.*

This large and interesting species has been known to naturalists a long time as inhabiting the common albatross (*Diomedea exulans*). After Fabricius, Dufour described it† at length, together with two other lice peculiar to the same bird. The most remarkable fact relating to my specimens is, that they come from the *Diomedea brachyura*, which inhabits only the Pacific north of the line, while the *D. exulans* is only found south of the equator. Thus it is very strange that two of the parasites inhabiting these birds should be identical, for the following species is also found in both.

The *L. Diomedæ* is $\frac{2}{10}$ ths of an inch in length; its form is elongated, and it is of a blackish-chestnut colour. The body is nearly glabrous; only a few hairs are scattered about the fore part and sides of the head, and on the sides of the abdomen.

The head is rather narrow, elongated, and quadrilateral; in the male deeply notched behind; in the female it has a more triangular shape, and is less notched behind. Dufour describes the head of the female as white, margined with chestnut-brown. In my specimens the white is reduced to a median line, rather larger than that on the head of the male.

Antennæ in the female (fig. 1) shorter than the head, nearly straight, and composed of five cylindroid joints. Those of the male (fig. 2), in form and insertion, resemble more mandibules or *maxilli-pedes* than *antennæ*. Redi first drew attention to this remarkable fact in his *Pulex pavonis*.‡

In the male *L. Diomedæ* the antennæ consist, as in the female, of five joints, and are about $\frac{1}{10}$ th of an inch in length.

* Joh. Christ. Fabricii, 'Entomologia Systematica,' tom. iv, p. 421, Hafniæ, 1794. He describes it thus:—"Capite obtuso albus, abdominis lateribus nigris."

† L. Dufour, "Description et Iconographie de trois espèces du genre *Philopterus*, parasites de l'Albatros;" 'Ann. Soc. Ent. de France,' vol. iv p. 669, figs. 1 and 2, 1834.

‡ F. Redi, 'Exp. circa Gen. Ins.,' tab. 14.

The first joint is very thick and rounded, the convexity being outwards; on the basal portion of its inner side is a spine-like process; its proximal half is white, the rest chestnut-brown. The second and third joints are much smaller, both bent, and forming an elbow with the first. A little behind the extremity of the third joint, on its outer side, are placed the two terminal pieces, which are the same as in the female, showing how the normal type is not altogether done away with. This last part performs the tactile functions which belong to the antenna, while the rest is used as a prehensile arm, and embraces the female during copulation.

The eyes are prominent, lateral, and hemispherical, of moderate size. The mandibles are oblong, and bifid at their extremity, situated behind a large, rounded space, which is a suctorial apparatus.

The *thorax* consists of two distinct segments, the *prothorax* and the *metathorax*; it is longer than the head, and gradually widens from above downwards; its sides are notched by a row of small tubercles. The metathorax is about three times as long as the prothorax, which supports the anterior pair of legs. Dufour states that the inferior part of the metathorax is divided into three longitudinal portions in the males. These were not very distinct in the specimens I examined; but the mesial dorsal groove, and the tuft of long, stiff, reddish hairs, directed backwards on the anterior side of each of its posterior angles, were very distinct; each tuft consists of seven long setæ; they are common to both sexes.

The *abdomen* is longer than the head and thorax together; it is composed of nine segments, the last one being small and inconspicuous; in the male it forms a single truncated process, divided by a cleft, but not bifid; in the female it is deeply cleft, forming two processes, each provided with two long setæ, which had been broken off in my specimens. The inferior margin of each abdominal segment is bordered by a narrow white line.

The anterior pair of legs are very short, thick, and strong, being evidently scansorial; the middle and posterior pairs are much longer, especially the last; the *coxae* are of moderate size; the *femora* and *tibiae* long and strong; the *tarsi* rudimentary, and terminated by two curved claws of equal size, and parallel. On the inner side of the distal extremity of the *tibiae* in the anterior pair of legs is a pointed spine. This species is found on the *Diomedea exulans* and on the *D. brachyura*, and probably on the other species of *Diomedea*.

Genus DOCOPHOROIDES, Denny, MSS.

This genus has been proposed by Mr. Denny, and will be published in his forthcoming work on 'Exotic Anoplura.'

The species which form it present the same general characters as the genus *Docophorus*, but they have the head rather smaller in proportion, the thorax larger, and the *antennæ* in the males are modified, though not so much as in the preceding genus.

Docophoroides brevis. (Pl. I B, figs. 3, 4.)

Docophoroides taurus, Denny.

Philopterus brevis, Dufour.

This smaller species also infests *D. exulans*, from which Dufour described it.* I have it from *D. brachyura*.

Body short, broad, and ovate; of a uniform brown-chestnut colour. Length $\frac{3}{10}$ ths of an inch. Head large, sub-triangular, broader in the male at the base; occipital border sinuous, with the posterior angles detached and rounded, provided with a few diverging hairs. The anterior part of the head terminates in a truncated snout, with a chaperon-like, circumscribed space of a lighter colour, separated from the rest of the integument by a whitish line. On each side of the head in both sexes, above the insertion of the *antennæ*, is a pointed process directed backwards.

Antennæ simple, and nearly straight in the female; composed of five cylindro-conoid joints. Those of the male are sub-cheliform; the modification, however, is not carried so far as in the *L. Diomedæ*. The first point is cylindrical, about half as long as the second; the third is bent, and obliquely truncated distally; the two last joints, having the normal form, are inserted in the midst of this truncation.

Eyes hemispherical, of moderate size.

Thorax about as long as the head, marked by a mesial longitudinal groove; it diminishes from down upwards. The *prothorax* is distinct from the metathorax, which has a small tuft of setæ on the interior of its posterior angles.

The abdomen is broader than the head, very broad in the female, and about as long as the head and thorax together; in the male it is narrower and longer. It is composed of eight segments, and in the female is cleft at its extremity; in the male the abdomen, besides the eight segments, has an additional rounded piece, covered with large setæ; above it, on the median line, is the reproductive apparatus, with a

* Loc. cit., p. 674, fig. 3.

copulating organ (fig. 5), which has a dilated extremity of the shape of an arrow-head, with a duct running through its middle.

The legs are thick and short, the *femora* very thick and rounded; the first pair are shorter than the other two, and have two spines at the distal extremity of their *tibiæ*; on the under margins of the *tibiæ* of the intermediate and posterior pair of legs are seven or eight tufts of *setæ*, bent backwards.

Genus *DOCOPHORUS*, Nitzsch,* Denny.†

Body broad. Head very large, temples rounded; two movable trabeculæ in front of the antennæ, which are alike in both sexes. The last segment of the abdomen is entire and rounded in the male. They live on all birds except *Gallinæ* and *Columbæ*.

Docophorus mandarinus, Giglioli, sp. nov. (Pl. I B, fig. 9).—This small and curious species inhabits the Chinese blackbird, *Merula mandarina*. Its length is about $\frac{1}{10}$ th of an inch; its body has the shape of a flask, the head being the stopper; it is of a light-brown colour.

The head is enormous, triangular, produced anteriorly into a broad truncated snout, with a large space divided off by a narrow white line. *Trabeculæ* large and rather obtuse.

Antennæ straight, composed of five cylindroid joints, the basal one being the largest. Posterior angles of the head large and rounded, with a few divergent hairs on the edge; occipital line sinuous. Mandibules thick and bifid.

Thorax about half as long as the head; it widens gradually downwards, but is always narrower than the head. The *prothorax* is very narrow, the metathorax is wider, but both are very short, and, were it not for the legs, would be confounded with the abdominal segments; the metathorax, as these, has a transverse line of long *setæ* on its inferior margin.

The abdomen is divided into eight segments, the last being cleft in the female. I possess no male.

Legs short and thick, especially the first pair, which are evidently scansorial; the *femora* are broad and convex externally; the *tibiæ* are short and thick, with spines at their distal extremities; the tarsi are rudimentary, and terminate in two claws.

Genus *NIRMUS*, Nitzsch.‡

Body narrow. Head of moderate size; temples more or less

* 'Thierinsekten,' p. 31.

† 'Anop. Brit.,' p. 63.

‡ 'Thierinsekten,' p. 33.

rounded; *trabeculae* obsolete or fixed. Antennæ equal in both sexes, or rarely thicker in the males.

They are found in considerable numbers on all birds.

Nirmus mandarinus, Giglioli, sp. nov. (Pl. I B, figs. 7 and 8).—Body long and narrow; its total length is rather more than $\frac{1}{10}$ th of an inch. This species inhabits also the *Merula mandarina*; another, the *N. merulensis*, infests the European blackbird. This *Nirmus* is of a whitish colour, edged all round with brown.

Head decidedly triangular, rather large; in front, a small space is divided from the rest by a white line; the occipital line is nearly straight. Antennæ simple, composed of five cylindroid joints; *trabeculae* small and inconspicuous; mandibles rather slender.

Thorax shorter than the head, and much narrower; distinctly divided into a prothorax and metathorax.

The abdomen is very large; it is at first narrow, then enlarges, and is truncated and broad distally; it consists of eight segments, the last being very slightly cleft; a few hairs are scattered on it.

Legs rather long and thick, even the anterior pair; the terminal claws are also long and much curved.

The three remaining insects I shall describe are Diptera, and belong to the *Pupiparæ*, insects which live by sucking the blood of mammals and birds, on which they are found, by means of an apparatus more conformable to that of certain Acarina than to the proboscis of other *Diptera*.

Two of my species belong to the family of the *Coriaceæ* or *Hippoboscidae*, one being an *Ornithomyia*, the other a *Strebla*. Before describing them I must give my best thanks to Professor Westwood, of Oxford, for the kind aid he has given me.

Genus ORNITHOMYIA, Latreille.

Eyes distinct; ocelli usually three in the vertex; wings incumbent, full sized; nerves distinct, extending to the apex; antennæ ciliated; tarsi with tridentate claws. They inhabit only birds.

Ornithomyia Chinensis, Giglioli, sp. nov. (Pl. I B, fig. 10).—This is as yet the only species received from China. Mr. Swinhoe found it on the *Turdus obscurus*. It is, when living, of a dark-green colour. The total length of its body is $\frac{3}{10}$ ths of an inch.

The head is rounded, the occipital line being quite straight. The antennæ are short, sub-ovate, and covered with thickish

hairs. Ocelli not very distinct; eyes large, occupying the whole of the sides of the head; facets pretty equal in size. The buccal apparatus is distinct; the *clypeus* of the fore part of the head very conspicuous.

Thorax quite round, with a few hairs scattered over it.

Abdomen also globular, thickly covered with short hairs; in one of my specimens it terminates in three rounded prominences, the middle one being double and covered with very thick bristles. The abdominal and thoracic spiracles are very distinct.

Legs thinly clad with hairs, of moderate length, very strong, and the tarsi are six-jointed, the fifth joint being the largest; the sixth supports two very large acuminate and sharp claws, bent on themselves; the foot-cushions are whitish, and of moderate size.

Wings about $\frac{5}{10}$ ths of an inch in length; ribs very distinct, the first one fringed with a row of short, thick hairs.

Genus STREBLA, Wiedemann.

Eyes small, triangular. Ocelli? Wings incumbent, rotundate, longer than the abdomen, with parallel veins. These small flies, of which only two or three species are known, infest only and live exclusively on bats.

Strebla molossa, Giglioli, sp. nov. (fig. 12).—This interesting species is found on the Chinese *Molossus*, together with the following.

Head rounded, covered with hairs, and placed far between the anterior legs. *Antennæ* short and broad, covered with hairs. A sub-ovate clypeus is very distinctly marked off from the rest of the head. Eyes rudimentary; I could find no ocelli.

Thorax oval and elongated, covered with short hairs; it has a median groove on the ventral side.

The abdomen is elongated, covered with long, thick hairs; in one specimen, very likely a male, towards its extremity were two long blade-like organs, doubtless subserving copulatory purposes; in the other specimen the abdomen terminates in a median rounded prominence.

Legs of moderate length, the posterior pair the longest; they are very hairy, and the joints broad and flattened. The tarsi end in two very sharp, uncinated claws; the foot-cushions are large, and covered with long, thin hairs; the last joint of the tarsi, which supports the claws, widens considerably distally.

Wings ample, long, and broad, fringed all round with short

hairs, and covered with a downy hair, amongst which are scattered a few larger hairs; veins distinct and parallel; length about $\frac{1}{10}$ th of an inch. The length of the body is a little more than $\frac{1}{10}$ th of an inch.

The following most interesting insect belongs to that anomalous family the *Nycteribiidae*, wingless, long-legged, spider-like creatures, which inhabit exclusively Vespertiliones. Professor Westwood, who kindly examined my specimens, proposed to make them types of a new genus; and having lately studied the *Nycteribiidae* with some care, I cannot but agree as to the propriety of such a thing.

Genus POLYCTENES, Westwood and Giglioli.

Head large and prominent, elongated, obtuse, and rounded in front; on its posterior dorsal part is a plate of a nearly semicircular form, edged all round with thick spines. On the sides of the fore part of the head are two three-jointed organs (antennæ?), bent backwards. A short neck-like piece joins the head to the thorax, which is elongated and divided into two parts.

The *prothorax* is double the size of the *metathorax*, and is bordered posteriorly with a line of large spines, as those on the head in the male.

Abdomen of moderate size; it enlarges distally, and is segmented.

Anterior legs rather short, the two following pairs rather long and slender.

Polyctenes molossus, Westwood and Giglioli (Pl. I B, figs. 13 and 14).—This remarkable creature inhabits the Chinese *Molossus*.

Body of a light colour, about $\frac{5}{40}$ ths of an inch in length.

Head rounded in front, where a well-marked clypeus, of a nearly semilunar shape, is divided off; just under its posterior angles are inserted the two antennæ (?); over their insertion are five large spines on each side; these do not exist in the other specimen, which I take to be a female. Each antenna consists of three rather thick, cylindroid joints, the basal one being the longest and the thickest; a few hairs fringe their inner borders, and they are bent backwards. Do they at all correspond to the organs which have been termed *palpi* and *maxilli* in *Nycteribia*? The integument of the head is finely striated; a few hairs are scattered over it. I could make out nothing like eyes, and therefore suppose that those organs do not exist.

The buccal apparatus appears well developed, and very

similar to that of *Nycteribia*. At the back of the dorsal part of the head is a large semicircular plate, wider than it; its anterior margin is fringed with large truncated spines, while the posterior margin has a row of lanceolate spines; in the female this plate is rather smaller, and has anteriorly a double row of large spines, and posteriorly an incomplete row of large hairs.

The *thorax* is large, covered with hairs; the prothorax is sub-oval, fringed posteriorly by a line of large lanceolate spines; the prothorax in the female is more distinct, and has not the posterior line of spines. The *metathorax* in the male is much smaller than the prothorax, and ends in a point; in the female it consists of two oval pieces.

The *abdomen* is divided into nine segments in both my specimens, one of which I take to be a male; it has a broader abdomen, with a pointed, bent, copulatory organ on the last segment. In the female the last segment has a rounded terminal prominence. In both sexes the abdomen is covered with hairs.

The anterior legs are short and strong, terminating in two small claws and several spines; their *femora* are very broad. The intermediate and posterior pairs of legs are much longer and more slender. Their tarsi terminate in two uncinated and sharp claws, with two tubercles at their base in the male, and lower down on the tarsi of the female are two more claws. I observed no rudiments of wings.

All the insects described in this paper were collected at Amoy.

JOURNAL OF MICROSCOPICAL SCIENCE.

DESCRIPTION OF PLATE I B,

Illustrating Henry Giglioli's paper on some Parasitical
Insects from China.

Fig.

- 1.—*Lipeurus Diomedæ*, female, about two and a half times larger than nature; the dorsum is shown.
- 2.—*L. Diomedæ*, male; the ventral side is exposed.
- 3.—*Docophoroides brevis*, female, magnified about three times; ventral aspect.
- 4.—*D. brevis*, male, magnified about three and a half times; dorsal aspect.
- 5.—Copulating organ of *D. brevis*, greatly magnified.
- 6.—Tibia and tarsus of a leg of *D. brevis*, magnified.
- 7.—*Nirmus mandarinus*, magnified seven times; ventral aspect.
- 8.— „ „ dorsal aspect.
- 9.—*Docophorus mandarinus*, magnified about seven times; dorsal aspect.
- 10.—*Ornithomyia Chinensis*, magnified about two and a half times; ventral aspect.
- 11.—Tarsus and claw of *O. Chinensis*, magnified.
- 12.—*Strebla molossa*, magnified about six times; ventral aspect.
- 13.—*Polyctenes molossus*, magnified about six times; dorsal aspect.
- 14.—Head of *P. molossus*, magnified.
- 15.—Spines from head of *P. molossus*, magnified.

